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HAVING FLOWN AROUND THE MOON, THE AUTOMATIC STATION " ZOND-5" SUCCESSFULLY RETURNED TO EARTH WITH SECOND COSMIC VELOCITY

(TASS COMMUNIQUE)

(USSR)

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"PRAVDA" of 23 Sept. 1968
Tass Communique

As already communicated, the automatic space station "ZOND-5" was launched in the Soviet Union on 15 September 1968. After seven-day flight along the path Earth-Moon-Earth, the station returned to Earth.

FOR THE FIRST TIME IN THE WORLD A SOVIET SPACECRAFT WAS SUCCESSFULLY RETRIEVED ON EARTH AFTER HAVING FLOWN AROUND THE MOON, BRINGING ALONG A LARGE VOLUME OF SCIENTIFIC INFORMATION.

On 21 September 1968 at 1854 hours Moscow Time, the automatic station reentered the Earth's atmosphere with second cosmic velocity of about 11,000 m/sec, splashing down in a precalculated equatorial region of the Indian Ocean at 1908 hours.

This took place at a point with coordinates: 32°38' S.lat and 65°33' E.long. The station's motion in the portion of the atmosphere corresponding to aerodynamic breaking took place along a ballistic trajectory.

The station's descent was completed by parachute after the aerodynamic deceleration. Alongside with its scientific apparatus, the station was salvaged on board of the Soviet search-rescue ship.

Following were the accomplishments during the flight of "ZOND-5" :

- Flight around the Moon;
- scientific investigation in the space surrounding the Moon;
- return to Earth with second cosmic velocity and soft-landing at a preassigned region.

In the process of flight the systems and station's outfits were operated so as to maneuver over the flight and return trajectories to Earth. The guidance system and radioengineering means for measuring trajectory parameters assured the solution of problems set up. The program of scientific investigations and complex tests of onboard systems and outfits of AS "Zond-5" was fully completed. The successful flight of "ZOND-5" along the parth Earth-Moon-Earth with return to a preassigned region constitutes an outstanding attainment of Soviet science and technology. A new problem was solved and perspectives were open for further research of outer space and of solar system's planets by space stations, with the retrieving of the scientific material thus collected.

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COMMENTS BY SCIENTISTS

COMMENTS by Academician G. PETROV
Director of the Institute of Space Research
of the USSR Academy of Sciences.

The experiment carried out with the AS "ZOND-5" had before it the problem of operating the systems assuring the return to Earth of crafts capable to fly past the Moon, and subsequently past other planets.

The first AES usually burned out in the upper layers of the atmosphere upon completion of their work. Subsequently systems were tested and made operational, allowing the return to Earth of spacecrafts with moderate overloads and with preservation inside them of preassigned temperatures and pressures. These operations opened up new possibilities for studying the outer space, laying the path to manned flights.

The problem of return to Earth of the AS after flight around the Moon brought about new and more complex problems to scientists and engineers. This refers first of all to guidance systems allowing to enter the atmosphere correctly and in such a way that overloads be not too big. Exceptionally difficult problems are linked with aerodynamics and the calculation of thermal flows for a device entering the atmosphere with second cosmic velocity.

The second cosmic velocity sets forth more complex requirements by comparison with the problems already solved, which are connected with atmosphere reentry at first cosmic velocity. If at entering the atmosphere under these last conditions the temperature of the layer between the shock wave and the device was of the order of 8000°, in the case of reentry with second cosmic velocity it attains up to 12 - 13 thousand degrees, while energy fluxes at the expense of radiation are proportional to the fourth power of temperature. Consequently, these factors acquire a decisive significance when determining the thermal flows toward the device and alter substantially the aerodynamics.

The experiment just carried out allowed us to verify all these assumptions, laid in the calculations and construction of "ZOND-5". From this viewpoint the significance of the experiment can hardly be overestimated. It presages a new stage in the development of space technology.

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COMMENTS BY ACADEMICIAN LEONID SEDOV

By achieving the flight of AS "ZOND-5", Soviet conquerors marked a new important step forward in the investigation of interplanetary space. For the first time in the whole world has a flying craft laid the path Earth-Moon-Earth, accomplishing a soft landing in a preassigned region. Thus a new stage of interplanetary flight development has been achieved.

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The successful return of the space station and its soft landing at a preassigned spot in the Indian Ocean were performed with the second cosmic velocity. This is qualitatively a new technical achievement. It is linked with the solution of complex problems of automatic guidance, aerodynamics that stand during the reentry of the flying craft into the atmosphere, in the given case with a velocity of nearly 11 kilom./sec. As is well known, during the landing of AES their initial velocity in the atmosphere does not exceed 8 kilometers. Such a great velocity increase required narrowed reentry angles in the direction of station's motion and reliable shielding from extremely high temperatures arising at the surface of the device.

This experiment shows that the return of flying crafts from the region of the Moon to Earth is not only quite realistic, but also quite assured by the creation of the indispensable technical means. The new success of Soviet conquerors of outer space demonstrated once more the high level of national science and technology in our motherland, and the systematic mastering of the near-solar space.

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N.B. The "PRAVDA" issue of 24 September publishes a series of reactions in the form of "letters", repeating exactly the same.Their translation is not justified. Moreover, considerable space is devoted to excerpts of foreign comments.

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on 26 September 1968

* The above translations were following the original text as closely as possible, sometimes in disregard to idiomatic English.